

In the claims:

1 - 9 (Canceled)

D/ 10. (Amended) An ion doping apparatus comprising:

an ion source containing ions of a dopant gas;

an extraction electrode for extracting the ions of said dopant gas to form a flow of ions of the dopant gas;

an acceleration electrode for accelerating the flow of the ions of the dopant gas toward a substrate;

a substrate holder for holding said substrate; and

coils located between said extraction electrode and said acceleration electrode ~~to shape a cross section of said flow into a line shape wherein said cross section is taken along a plane perpendicular to the flow, and~~ wherein a diameter of said coils is monotonically decreased as the flow of said ions extends downstream; and

a means for moving said substrate in an orthogonal direction to an elongation direction of said line shaped cross section.

11 - 20 (Cancelled)

21. (Amended) An ion doping apparatus comprising:

a means for generating an ion current having an elongated cross section;

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Canceled*
~~a means for applying a first magnetic field~~ coils to focus said ion current, wherein a diameter of said coils is monotonically decreased as a flow of said ion current extends downstream;

a means for applying a ~~second~~ magnetic field to said ion current in a direction substantially parallel with said elongated cross section of said ion current;

a slit for cutting a portion of said ion current; and

a stage which moves in a direction substantially perpendicular to said elongated cross section of said ion current.

22. (Original) An ion doping apparatus according to claim 21, further comprising a means for irradiating a laser beam having an elongated cross section.

23. (Canceled)

24. (Amended) An ion doping apparatus according to claim 21, wherein said ~~second~~ magnetic field has a strength between 0.1 to 10 tesla.

25. (Amended) An ion doping apparatus comprising:

a means for generating an ion current having an elongated cross section;

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~~a means for applying a first magnetic field~~ coils to focus said ion current, wherein a diameter of said coils is monotonically decreased as a flow of said ion current extends downstream;

a means for accelerating said ion current focused by said first magnetic field;

a means for applying a ~~second~~ magnetic field to said ion current in a direction substantially parallel with said elongated cross section of said ion current; and

a stage which moves in a direction substantially perpendicular to said elongated cross section of said ion current.

26. (Original) An ion doping apparatus according to claim 25, further comprising a means for irradiating a laser beam having an elongated cross section.

27. (Canceled)

28. (Amended) An ion doping apparatus according to claim 25,
wherein said [second] magnetic field has a strength between 0.1
to 10 tesla.

29 - 45 (Canceled)

Please add new claims 46-61 as follows.

46. (New) An ion doping apparatus comprising:
a means for generating an ion current having an elongated
cross section;
a means for applying a first magnetic field to the ion
current; and
a means for applying a second magnetic field to the ion
current after applying said first magnetic field,
wherein said first magnetic field has a same magnitude as
said second magnetic field and has an opposite direction to said
second magnetic field.

47. (New) An ion doping apparatus according to claim 46,
further comprising a coil for focusing said ion current.

48. (New) An ion doping apparatus according to claim 46,
further comprising a slit between the means for applying the

first magnetic field and the means for applying the second magnetic field.

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49. (New) An ion doping apparatus according to claim 46, further comprising a means for irradiating a laser beam having an elongated cross section.

50. (New) An ion doping apparatus comprising:
a means for generating an ion current having an elongated cross section;

a means for applying a first magnetic field to the ion current;

a means for applying a second magnetic field to the ion current after applying said first magnetic field; and

a stage which moves in a direction substantially perpendicular to said elongated cross section of said ion current,

wherein said first magnetic field has a same magnitude as said second magnetic field and has an opposite direction to said second magnetic field.

51. (New) An ion doping apparatus according to claim 50, further comprising a coil for focusing said ion current.

52.(New) An ion doping apparatus according to claim 50,
further comprising a slit between the means for applying the
first magnetic field and the means for applying the second
magnetic field.

53.(New) An ion doping apparatus according to claim 50,
further comprising a means for irradiating a laser beam having
an elongated cross section.

54.(New) An ion doping apparatus comprising:
a means for generating an ion current having an elongated
cross section; and
a means for applying a magnetic field and an electric field
to said ion current to separate said ion current into at least
two ion currents on a mass basis.

55.(New) An ion doping apparatus according to claim 54,
further comprising a means for irradiating a laser beam having
an elongated cross section.

56.(New) An ion doping apparatus according to claim 54,
wherein said magnetic field has a strength between 0.1 and 10
tesla.

57. (New) An ion doping apparatus according to claim 54, further comprising an accelerating electrode to accelerate only one of said two ion currents.

58. (New) An ion doping apparatus comprising:
a means for generating an ion current having an elongated cross section;
a means for applying a magnetic field and an electric field to said ion current to separate said ion current into at least two ion currents on a mass basis; and
a stage which moves in a direction substantially perpendicular to said elongated cross section of said ion current.

59. (New) An ion doping apparatus according to claim 58, further comprising a means for irradiating a laser beam having an elongated cross section.

60. (New) An ion doping apparatus according to claim 58, wherein said magnetic field has a strength between 0.1 and 10 tesla.

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61. (New) An ion doping apparatus according to claim 58,
further comprising an accelerating electrode to accelerate only
one of said two ion currents.
